UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/042,827	01/04/2002	Upendra V. Chaudhari	YOR920010539US1(590.076)	7326

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FERENCE & ASSOCIATES
409 BROAD STREET
PITTSBURGH, PA 15143

EXAMINER
PIERRE, MYRIAM

ART UNIT	PAPER NUMBER
2654	

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/042,827	CHAUDHARI ET AL.
	Examiner	Art Unit	
	Myriam Pierre	2654	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _06 June 2005_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _121_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-21_ is/are rejected.

7)☒ Claim(s) _1_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _03/11/2002_ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   Applicant's Amendment filed 01/04/2005, responding to the OA of 06/06/2005,

Examiner acknowledges amendment to the claims.

Objection to the Amendment

2.   The amendment filed 01/04/2005 is objected to under 35 U.S.C. 132(a) because

it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no

amendment shall introduce new matter into the disclosure of the invention. The added

material which is not supported by the original disclosure is as follows: "said clustering

being independent of any system" in claim 1.

Response to Arguments

3.   Applicant's arguments have been fully considered and the applicant's arguments

are not persuasive for the following reasons:

Regarding the 101 and 112 rejection, the applicant rewrites "clustering of speech

and audio data" to the preamble, however, the limitation does not erase the non-

statutory rejection because the limitation remains unclear, is the input data speech

and/or audio? Which ever is the case, the limitation should be in the essential part of the

claim, not merely in the preamble. Because the applicant has not satisfied the 101

requirements, claim 1 remains non-statutory.

Applicant argues that Passera is in stark contrast to the application because " as

discussed in the specification and in the independent claims, the instant invention

obtains input data and facilitates data clustering of that input data independent of any

system or model", however, examiner respectfully disagrees and brings to light that the

limitation "data independent of any system or model" is not found in the specification

and thus is considered as new matter. Moreover, the term "of any system" is vague and

indefinite, applicant fails to clarify which kind of system is inclusive or exclusive. The

term "of any system" does not limit the claim nor does it add understanding to the

claimed invention, thus "said clustering being independent of any system" is both

indefinite and is not supported in the specification.

Applicant argues that Passera does not disclose facilitating data clustering of

input data independent of any system, however, Passera does not disclose data

clustering input data dependent of any system, thus the system is inherently

independent. Passera uses a sensitivity measure of the dimensions of the input data

(ranking via the type of sensitivity measured is inherently clustering) may be a rank

ordered and the dimension having the highest sensitivity may be selected (col. 4 lines 2-

5).

Regarding applicant's argument with respect to 35 USC 103, Applicant's

arguments with respect to claim 1 have been considered but are moot in view of the

new ground(s) of rejection.

In response to applicant's argument that there is no suggestion to combine the

references, or that there is no natural connection from the super-vectors of Kuhn et al.

to the input spaces of Passera. Kuhn's implements an eigenvector projection in order to

improve speed and efficiency at which speaker and environment adaptation is

performed, as taught by Kuhn, (col. 2, lines 16-19), Passera teach modeling input (Fig.

1 element 10) and Kuhn models input for speech adaptation, observed data from

speakers (col. 5 line 24, 29 and col. 8 lines 60-62). Thus, one would be motivated to

combine Passera's input model with Kuhn's speech adaptation data from speakers in

order to improve speaker adaptation, as taught by Kuhn (col. 1 lines 39-40, 61-62 and

col. 2 lines 16-19).

The examiner recognizes that obviousness can only be established by combining

or modifying the teachings of the prior art to produce the claimed invention where there

is some teaching, suggestion, or motivation to do so found either in the references

themselves or in the knowledge generally available to one of ordinary skill in the art.

See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958

F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the following obviousness

statements still stand.

Claim Rejections - 35 USC § 101

4.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

5.   Claims 1-21 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter.

Claims 1-21 define non-statutory processes because they merely manipulate an

abstract idea (obtaining input data) and mathematical structure (arranging input data

and creating predetermined non-overlap sub-sets of the input) without a claimed

limitation to a practical application   the disclosed invention in the technological arts (speaker verification); however, the claimed process, a series of steps to be performed on an apparatus, simply manipulates input data or mathematical structure without a claimed limitation to the practical application and does not have any post or pre-computer processing activities, an output, and a defined (speech or audio) data.

A review of application 10/042,827 shows the disclosed invention thereof to be an apparatus and method for facilitating clustering of speech and audio data. This is a practical application within the technological arts. However, it does not disclose specific hardware, specific software, a specific system, or a combination thereof for performing the claimed functions. The steps that formed the claimed process are devoid of any limitation to any practical application.

In the instant application the disclosure is directed to any and every structure for carrying out the claimed functions, and not solely to a specific structure.

Claims 1-21 reviewed in light of the specification, simply recite the abstract idea of obtaining input data for facilitating clustering of speech and audio data or mathematical structure (arranging input data and creating predetermined non-overlap sub-sets of the input).

As can be seen by claims 1-21 these claims recite directly a mathematical structure by setting forth the step of "arranging input data and creating predetermined non-overlap sub-sets of the input". These steps are mathematical in nature.

Reviewing the claims, we have a field of use limitation at the preamble of claims

1-21. This limitation does not in any way further limit the mathematical structure

because:

As per the claims, the language, "an apparatus for facilitating clustering of

speech and audio data" and "the method for facilitating clustering of speech and audio

data" does not transform the claimed subject matter into statutory subject matter. The

recital is merely a field of use or desired end use limitation.

The above review of the claims shows that the subject matter claimed in addition

to the mathematical structure is not sufficient on its own to render the claims as a whole

statutory.

It is readily apparent that when claims 1-21 are each taken as a whole, the

claims are directed to the preemption of a mathematical structure, and thus are non-

statutory.

Claim Rejections - 35 USC § 112

6.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

7.   Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

The limitations "any system" and "obtaining input data" in claims 1, 11 and 21

lacks antecedent basis.

The phrase "any system" and "obtaining input data" in claims 1, 11 and 21 is a relative limitation that renders the claim indefinite. The limitation "of any system" and "obtaining input data" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Drawings

8.   The drawings are objected to because Fig. 2, element 104 is unclear as to weather it corresponds to the data points to cluster or if it is already clustered and is recursively splitting the "input speech and/or audio data". The input, Xa should correspond to the non-overlapped subset X1, renaming the input speech and/or audio data as Xa is confusing. If the input is a new cluster of Xa, it would be clear if it was labeled X1a, X1b in order to distinguish the proper order of which speech and/or audio data is being recursively split.

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.   Claims 1-3, 11-13 and 21 are rejected under 35 U.S.C. 102(e) as being

anticipated by Passera (6,272,449).

        As to claims 1, 11 and 21, Passera teaches,

        obtaining input data ("input data set", Fig. 1, element 10);

        creating predetermined (predetermined, col. 4, line 60) number of non-

overlapping (CHAID, chi-squared automatic interaction detection, col. 1, line 35)

subsets of the input data ("data set" or "subspaces", Fig. 1, elements 18-19, col. 1, lines

31-34); and

        creating a predetermined number of non-overlapping subsets by

splitting the input data recursively ("data splitting model" splits input into subspaces,

"recursively split", col. 4, lines 16-19, 61-62 and Fig. 1, element 16).

        said clustering being independent of any system (rank ordered and the

dimension having the highest sensitivity may be selected (col. 4 lines 2-5); ranking via

the type of sensitivity measured is inherently clustering).

        As to claim 2 and 12, Passera teaches,

initially splitting the input data into at least two sets of output data ("input data set", "data

splitting module", output is subpace$_{1-2}$, Fig. 1, elements 10, 16 and 18-19).

        As to claim 3 and 13, Passera teaches,

splitting the at least two sets of output data recursively (output and "data-splitting"

module recursively splits subspaces, col. 4, lines 61-62, col. 5, lines 28-29 and Fig. 3,

elements 34 and 36); and

repeating the recursive splitting of output data sets (Fig. 4, see loop, elements 46-49)

until predetermined number of non-overlapping subsets is obtained (col. 4, lines 59-60).

3.   Claims 4-9, 10, 14-19, and 20 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Passera (6,272,449) in view of Kuhn (6,343,267).

        As to claim 4 and 14, Passera does not teach

an eigenvector decomposition relating to the input data.

        However, Kahn teaches

determining an eigenvector decomposition relating to the input data (eigenvectors

generated from speakers, col. 7, lines 8-9).

        At the time of the invention, it would have been obvious to one of ordinary skill in

the art to use eigenvector decomposition via data clustering in order to improve speed

and efficiency at which speaker and environment adaptation is performed, as taught by

Kuhn, (col. 1, lines 39-40 and 45, 50-59).

        As to claim 5 and 15, Passera teaches,

creating a predetermined number of non-overlapping subsets (col. 4, lines 59-61).

        Passera does not explicitly teach determining eigenvector projections.

        However, Kuhn teaches

adapted to determine vector projection coefficients (coefficients, col. 7, line 64) onto the

set of eigenvectors ("eigenvector", col. 8, line 52 and col. 2, line 34) in the eigenvector

decomposition ("eigentransformation vectors", col. 16, line 35).

At the time of the invention, it would have been obvious to one of ordinary skill in

the art to use Passera's data subsets and Kuhn's eigenvector projection in order to

improve speed and efficiency at which speaker and environment adaptation is

performed, as taught by Kuhn, (col. 2, lines 16-19).

As to claim 6 and 16, Passera does not teach the recited probability density.

However, Kuhn teaches determining a probability distribution for the vector of

projection coefficients (probability density for vector...from coefficient, col. 5, lines 30-

36).

At the time of the invention, it would have been obvious to one of ordinary skill in

the art to predetermine subset model for determining probability density because Kuhn

teaches that this will improve speed and efficiency at which speaker and environment

adaptation is performed, (col. 1, lines 39-40, 61-62 and col. 2, lines 16-19).

As to claim 7 and 17, Passera teaches,

yield the at least two sets of output data based on their relation to the threshold

("threshold value", col. 5 lines 37-41, 46-47; Fig. 5 step 52; and Fig. 4 subspace$_{1-2}$).

Passera does not teach doing this for projection coefficients.

However, Kahn teaches projection coefficients (projection col. 2, line 59 and coefficient, col. 7, line 64).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to relate threshold values for projection coefficient data in order to generate an adaptive model for speech.

Passera teaches assigning at least one threshold (col. 5, line 56), but does not teach of relating the threshold to a probability distribution value.

However, Kuhn's teaches maximum likelihood involving probability density (col. 5, lines 30-31 and col. 10, lines 31-33); and

At the time of the invention, it would have been obvious to one of ordinary skill in the art to assign threshold values based on probability density for clustering accuracy because the probability distribution function describes the plurality of parameters based on observed data from speakers, thus weights the data which is informative more heavily, as taught by Kuhn, (col. 5, line 24, 29 and col. 8, lines 60-62).

As to claims 8 and 18,

Neither Passera nor Kuhn teaches N-1 threshold values.

However, Official Notice is taken that it would have been obvious to one of ordinary skill in the art at the time of invention that one necessarily needs N-1 thresholds for splitting data into N clusters.

As to claim 9 and 19, Neither Passera nor Kuhn teach the threshold is a value of the function relating to the projection coefficients for which the probability distribution function equals m/N, where m is a number from 1 to N-1.

However, Official Notice is taken that it would have been obvious to one of ordinary skill in the art at the time of invention that for the equal probabilities of correct clustering, one needs to set an equal probability threshold, for 2 clusters setting it to ½, for 3 clusters to 1/3, etc.

4.   Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Passera (6,272,449) in view of Beigi (6,253,179).

As to claim 10 and 20, Passera teaches,

data clustering (col. 1, line 12).

Passera does not teach of speaker verification.

However, Beigi teaches relates to the enrollment of target speakers in a speaker verification system (speaker verification and clustering of data, col. 8, line 19-20 and 44).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to use speech data clustering in a speaker verification system in order to have training data for speaker models.

Conclusion

5.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from

the examiner should be directed to Myriam Pierre whose telephone number is 571-272-

7611. The examiner can normally be reached on Monday - Friday from 5:30 a.m. -

2:00p.m.

6.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone

number for the organization where this application or proceeding is assigned is 571-

273-8300.

7.   Information as to the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free).

07/18/2005

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER